Installation and User Manual



Power Analyzer PAN 312

FLYGT
a xylem brand

Table of Contents

Technical data

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Rated input voltage:	line to neutral: 185 V to 460 V; line to line: 320 V to 800 V
Rated input current (through CT):	5 A
Type of electrical system:	three phase, balanced/unbalanced load, with/without neutral
Power supply:	24-48 V AC/DC -15% +10%, 50-60 Hz
Power consumption:	AC: 6 VA DC: 3.5 W
Output:	Serial port RS485, MODBUS communication, 9600 bit/s, 1 start bit, 8 data bit, no parity, 1 stop bit
Overload protection:	continuously 6 A and 120% of rated input voltage; for 500 ms: 36 A and 200% of rated input voltage
Display menus:	total 18 menus
Display refresh time:	700 ms.
Current transformer ratio:	1 to 999
Voltage transformer ratio:	1.0 to 99.9
EMC:	emission EN61000-6-3 (residential class A); immunity EN61000-6-2 (industrial class A)
Approval:	CE
Standard:	safety EN61010 – IEC-60664
Connection:	screw type; maximum cable cross section: 2.5 mm2 (AWG11)
Protection degree:	front IP40; terminal IP20
Mounting:	DIN-rail
Operating temperature:	0°C to +50°C (32°F to 122°F)
Weight:	about 400 g (14.1 oz) incl. packing
Part No.	40 501526CG 8021210

Dimensions

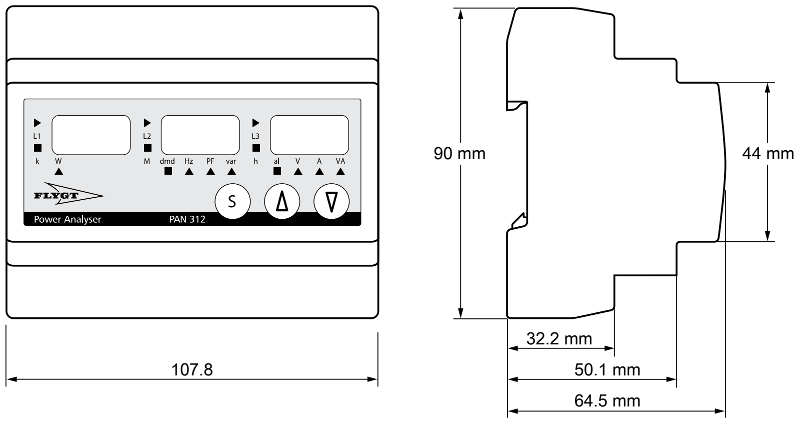


Figure 1

Connection/Electric diagram

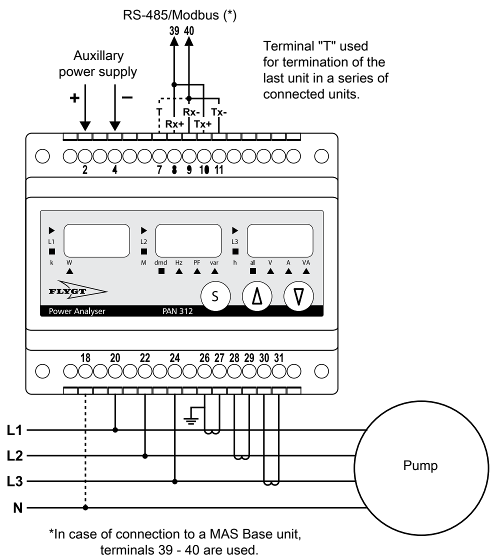


Figure 2

NOTICE:

The RS-485/Modbus connection terminals on PAN 312 differ from the old version, PAN 311. Make sure you connect according to the picture.



WARNING:

The current input can be connected to the line ONLY through current transformer; the connection of the CT's to earth MUST be carried out according to the electric diagram shown above; when the CT is connected to earth, a leakage current from 0 to 1.8 mA max is generated depending on input impedance, connection and the line voltage measured by the instrument.

Electrical Hazard:

EN

Electrical work must only be carried out by a qualified electrician and in accordance with local regulations. During installation, all equipment must be disconnected from the power supply without any possibility of being made live. Terminals 26, 27, 28, 29, 30 and 31 are connected to voltages up to 800 V.

CS

Práce na elektrickém zařízení musí provádět pouze kvalifikovaný elektrikář podle místních předpisů. Během instalace musí být veškeré zařízení odpojeno od napájení bez jakékoliv možnosti, že by se mohlo dostat pod napětí. Svorky 26, 27, 28, 29, 30 a 31 jsou připojeny k napětím až 800 V.

DA

Arbejde på elektriske installationer må kun udføres af en autoriseret elektriker og i overensstemmelse med de lokale forskrifter. Under installationsarbejdet skal al udstyret være koblet fra strømforsyningen uden nogen muligheder for at kunne aktiveres. Stik 26, 27, 28, 29, 30 og 31 er tilsluttet spændinger på op til 800 V.

DE

Arbeiten an der Elektrik sind ausschließlich von einem ausgebildeten Elektriker und gemäß den geltenden Bestimmungen vorzunehmen. Während der Installation ist die Stromversorgung zu allen Geräte zu unterbrechen und jede Möglichkeit auszuschließen, dass diese wieder eingeschaltet wird. Anschlüsse 26, 27, 28, 29, 30 und 31 können mit Spannungen von bis zu 800 V versorgt werden.

EL

Οι ηλεκτρολογικές εργασίες πρέπει να εκτελούνται μόνο από ειδικευμένο ηλεκτρολόγο και σύμφωνα με τους τοπικούς κανονισμούς. Κατά τη διάρκεια της εγκατάστασης, ολόκληρος ο εξοπλισμός πρέπει να είναι αποσυνδεδεμένος από την ηλεκτρική τροφοδοσία, χωρίς να υπάρχει το ενδεχόμενο να τεθεί υπό τάση. Οι ακροδέκτες 26, 27, 28, 29, 30 και 31 συνδέονται σε τάσεις μέχρι και 800 V.

ES

Los trabajos eléctricos deberán encargarse exclusivamente a un electricista cualificado y cumplir la normativa local. Durante la instalación, todo el equipo deberá permanecer desconectado de la alimentación eléctrica de manera que sea imposible que reciba corriente. Los bornes 26, 27, 28, 29, 30 y 31 están conectados a tensiones que pueden llegar a 800 V.

ET

Elektritöid võib teha üksnes kvalifitseeritud elektrimontöör ning tööde teostamisel tuleb järgida kõiki piirkonnas kehtivaid nõudeid. Paigaldamise ajaks tuleb kõik seadmed vooluvõrgust eraldada ning igasugune võimalus nende voolu alla sattumiseks peab olema välistatud. Klemmid 26, 27, 28, 29, 30 ja 31 ühendatakse kuni 800-voldise pingega.

FI

Sähkötyöt saa tehdä vain pätevä sähköasentaja, ja niissä on noudatettava paikallisia määräyksiä. Asennustöiden ajaksi laitteet on aina kytkettävä irti sähköverkosta ja huolehdittava, ettei niitä voi vahingossa kytkeä päälle. Liittimet 26, 27, 28, 29, 30 ja 31 liitetään enintään 800 V jännitteeseen.

FR

Les travaux électriques doivent exclusivement être effectués par un électricien professionnel et conformément aux réglementations locales. Pendant l’installation, l’ensemble de l’équipement doit être débranché de l’alimentation électrique et aucune partie ne doit rester sous tension. Les terminaux 26, 27, 28, 29, 30 et 31 sont branchés sur des tensions pouvant atteindre 800 V.

HU

Elektromos munkákat csak szakképzett villamos szakember végezhet, betartva a helyi előírásokat. Telepítés során minden berendezést le kell választani az elektronos hálózatról úgy, hogy az ne legyen visszakapcsolható. A 26, 27, 28, 29, 30 és 31 végberendezések maximum 800 V feszültségre kapcsolódnak.

Electrical Hazard:

IT

Le connessioni elettriche vanno effettuate esclusivamente da un elettricista qualificato in conformità alle normative locali. Durante l'installazione, tutta l'apparecchiatura va disconnessa dall'alimentazione di rete senza alcuna possibilità che diventi sede di potenziale elettrico. I terminali 26, 27, 28, 29, 30 e 31 sono connessi a tensioni fino ad 800 V.

LT

Elektros darbus turi atlikti tik kvalifikuotas elektrikas, laikydamasis vietinių taisyklių. Montavimo metu visa įranga turi būti atjungta nuo srovės tiekimo; neturi būti nei menkiausios srovės tiekimo atsinaujinimo galimybės. 26, 27, 28, 29, 30 ir 31 gnybtai prijungiami prie iki 800 V įtampos.

LV

Tikai kvalificēts elektriķis ir tiesīgs veikt elektrības darbus atbilstoši vietējiem noteikumiem. Uzstādīšanas laikā visam aprīkojumam jābūt atvienotam no energoapgādes, izslēdzot jebkādu nejaušas ieslēgšanas varbūtību. Termināļu Nr. 26, 27, 28, 29, 30 un 31 pieslēdz spriegumam līdz 800 V.

NL

Werkzaamheden aan elektrische installaties mogen alleen conform de geldende voorschriften worden uitgevoerd door vakbekwame personen. Tijdens werkzaamheden aan elektrische installaties moet alle apparatuur op een beveiligde wijze spanningsloos zijn. De aansluitingen 26, 27, 28, 29, 30 en 31 zijn aangesloten op een spanning tot 800 V.

PL

Prace elektryczne muszą być wykonywane przez wykwalifikowanych elektryków zgodnie z obowiązującymi przepisami. Podczas instalacji sprzęt musi być odłączony od źródła zasilania, tak aby niemożliwe było wystąpienie napięcia na jakimkolwiek elemencie. Złącza 26, 27, 28, 29, 30 i 31 są podłączone do napięcia mogącego osiągać 800 V.

PT

O trabalho eléctrico deve ser realizado por um electricista qualificado em conformidade com os regulamentos locais. Durante a instalação, todo o equipamento deve ser desligado da fonte de alimentação eléctrica sem nenhuma hipótese de activação eléctrica. Os terminais 26, 27, 28, 29, 30 e 31 estão ligados a tensões de 800 V no máximo.

SK

Elektrické práce môže uskutočňovať iba kvalifikovaný elektrikár, pričom v súlade s platnými predpismi. Pri inštalácii sa všetky zariadenia musia odpojiť od napájacieho zdroja. Musí sa vylúčiť akákoľvek možnosť pripojenia napätia. Svorky 26, 27, 28, 29, 30 a 31 sú pripojené na napätia dosahujúce až 800 V.

SL

Električarska dela mora izvesti kvalificiran strokovnjak - električar, v skladu z lokalnimi pravili in zahtevami. Med instalacijo morajo biti vse naprave izključene in ločene od omrežja, ter zavarovane pred nezaželenim vklopom. Priključki 26, 27, 28, 29, 30 in 31 so priključeni na napetost do 800 V.

SE

Elarbeten får endast utföras av en behörig elektriker och i enlighet med gällande lagstiftning. Under installationen måste all utrustning vara bortkopplad från strömförsörjningen och ska inte kunna göras strömförande. Uttagen 26, 27, 28, 29, 30 och 31 är anslutna till spänning på upp till 800 V.

NOTICE:

EN

Do not connect the instrument to the output side of a variable frequency drive (between the VFD and the pump) in order to avoid malfunctioning or damage.

CS

Nepřipojujte přístroj k výstupní straně budiče s proměnným kmitočtem (mezi budič a čerpadlo), aby nedošlo k poruše nebo poškození.

DA

For at forhindre fejl eller beskadigelse må instrumentet ikke sluttes til udgangssiden af et variabelt frekvensdrev (mellem VFD'et og pumpen).

DE

Zur Vermeidung von Funktionsstörungen bzw. Beschädigungen darf das Gerät nicht an die Ausgangsseite eines frequenzgestellten Antriebs (zwischen dem Mehrfrequenzmonitor und der Pumpe) angeschlossen werden.

EL

Για την αποφυγή δυσλειτουργίας ή βλάβης, μη συνδέετε το όργανο στην πλευρά εξόδου ενός συστήματος μετάδοσης κίνησης μεταβλητής συχνότητας (μεταξύ του VFD και της αντλίας).

ES

Para evitar que se produzcan fallos de funcionamiento o averías, no conecte el aparato en el lado de la salida de un variador de velocidad (VFD), es decir, entre éste y la bomba.

ET

Töökindluse tagamiseks ja rikete vältimiseks ei tohi seadet ühendada reguleeritava sagedusega ajami väljundahelasse (ajami ja pumba vahele).

FI

Älä liitä laitetta muuttuvataajuuskäytön lähtöpuolelle (käytön ja pumpun välille), jotta järjestelmän toiminta ei häiriinny tai järjestelmä vaurioidu.

FR

Afin d'éviter tout risque de dysfonctionnement ou de dommage, ne branchez pas l'appareil sur le côté sortie d'un système d'entraînement à fréquence variable (VFD) (entre le VFD et la pompe).

HU

A hibás működés és károsodás elkerülése érdekében ne csatlakoztassa a készüléket a változtatható frekvencia-szabályozó kimeneti oldalára (a VFD és a szivattyú közé).

NOTICE:

IT

Non connettere lo strumento all'uscita di un'unità a frequenza variabile (fra l'unità a frequenza variabile e la pompa) onde evitare funzionamenti errati o danni.

LT

Nejunkite prietaiso prie kintamo dažnio pavaros išvado pusės (tarp kintamo dažnio pavaros ir siurblio), kad išvengtumëte blogo veikimo ar pažeidimų.

LV

Ierīci nedrīkst pievienot mainīgas frekvences pievada izvades pusei (starp mainīgās frekvences pievadu un sūkni), lai izvairītos no ierīces nepareizas darbības vai bojājumiem.

NL

Sluit het apparaat niet aan op de uitgangszijde van een aandrijving met variabele frequentie (tussen de VFD en de pomp) omdat dit storing of schade kan veroorzaken.

PL

Aby uniknąć niewłaściwego działania lub uszkodzenia urządzenia, nie należy go podłączać do wyjścia napędu ze zmienną częstotliwością (między napędem VFD a pompą).

PT

Não ligue o instrumento à saída de uma engrenagem motriz de frequência variável (entre a VFD e a bomba) de forma a evitar mau funcionamento ou avaria.

SK

Nepripájajte prístroj k výstupu pohonu s frekvenčnou reguláciou (medzi VFD a čerpadlo). Takto vylúčite riziko chybnej funkcie alebo poškodenia.

SL

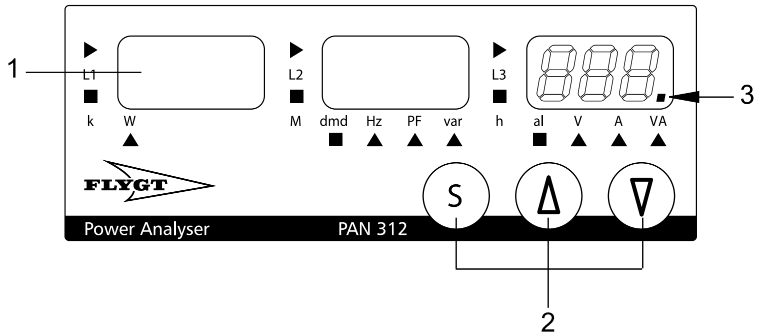
Ne priključujte instrumenta na izhodno stran variabilnega frekvenčnega pogona (med VFD in črpalko), s tem se izognete nepravilnemu delovanju ali poškodbam naprave.

SE

Anslut aldrig instrumentet till utgångssidan på en frekvensomriktare (mellan frekvensomriktaren och pumpen) eftersom det då kan uppstå skador och funktionsfel.

Front panel description

Front panel description

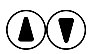


1. Display
   LED display with alphanumeric indications to:
   • display configuration parameters;
   • display all the measured variables.
2. Key pad
   To program the configuration parameters and the display of variables.



Key to:

- enter **Setup** mode when in **View** mode
- enter **Editing** mode for a function when in **Setup** mode
- confirm selection or value



Keys to:

- step through view menus
- step through functions in setup menus
- change selection or values when in **Editing** mode

3. Decimal point blinking
   When measuring voltage: Phase to phase
   When measuring power: Wrong connection

k	kilo (1000)
W	Active power (Watt)
M	Mega (10^6)
dmd	Displayed value is an average formed over 1 - 30 minutes (configurable)
Hz	Frequency
PF	Power factor
var	Reactive power (voltampere reactive)
h	hours, used to indicate kWh
al	alarm
V	Volt
A	Ampere

VA	VoltAmpere

Figure 3

Menu structure

Menu structure

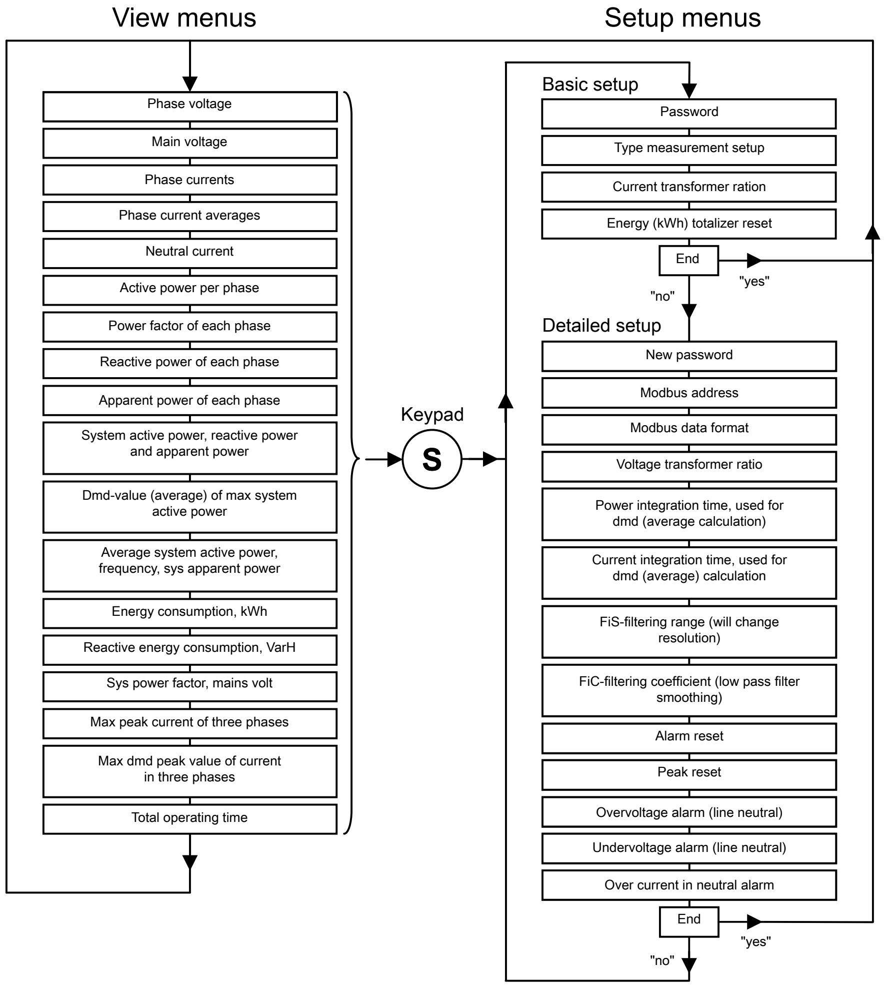


Figure 4

The menu structure is divided in two parts; View and Setup

View:

- 18 menus displaying system variables and measures values

Setup:

- Divided in two levels:
  - Basic setup level for setting functions necessary for the PAN 312 to work. Usually enough for use with MAS.
  - Detailed setup level for setting more advanced functions.

Key pad actions - Setup mode

Key pad actions - Setup mode

NOTICE:

Read the safety precautions and the specification carefully.

Connect wires according to the wiring diagram.

Key pad functions in Setup mode

(S)
- enter **Setup** mode when in **View** mode
- enter **Editing** mode for a function to change value/selection, "**PrG**" shown in the display
- confirm selections or value

(▲)
- scroll to the previous function
- in **Editing** mode ("**PrG**" in display) increase parameter value or change selection

(▼)
- scroll to the next function
- in **Editing** mode ("**PrG**" in display) decrease parameter value or change selection

NOTICE:

To accept changes made on the setup functions you must step to the "End" parameter (either function number 5 or number 19) and confirm with the "S" button.

In case no key is pressed for 30 seconds, the display reverts to the View mode and possible parameter settings are lost.

Meaning of the third display in Setup mode

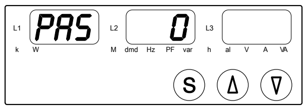
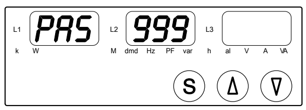
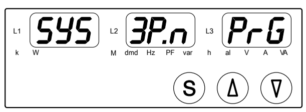
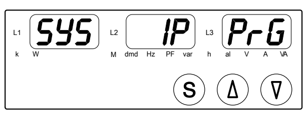
If the third (rightmost) display reads "r.XX" (where XX is the program revision number e.g. 01, 02 or 03) or is empty (depends on revision number) you are in Setup mode but not in Editing mode.

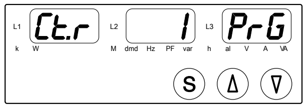
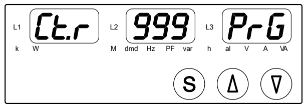
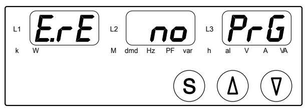
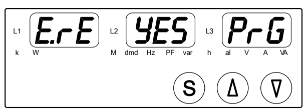
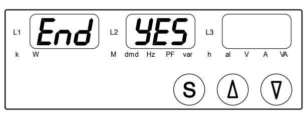
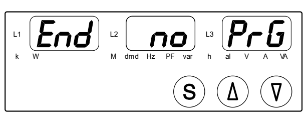
To enter Editing mode to change the parameter value/selection press 'S'. The third display now reads "PrG".

Basic setup

Basic setup

Table 1: Set the PAN 312 using the key pad and go through the following steps:

			Default
0.		Press 'S' to enter **Setup** mode.	
1.	 Figure 5  Figure 6	"**PAS**": if you enter the correct password you access the setup main menu. Enter correct password (default is '0') using ▲ and ▼. Confirm by pressing '**S**'	0
2.	 Figure 7  Figure 8	"**SYS**" (System selection). If you want to change system mode press 'S' to enter editing mode "**PrG**" and choose the correct electrical system with ▲ and ▼. Confirm by pressing '**S**' Press ▼ to go to the next setup function. Press ▲ to go to the previous setup function. "**SYS**" electrical system selection, choose the correct electrical system. "**3P.n**" 3-phase unbalanced load with or without neutral. "**3P.A**" 3-phase ARON. "**3P**" 3-phase balanced load. "**2P**" 2-phase "**1P**" 1-phase	3P.n

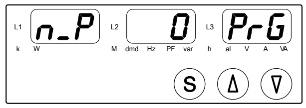
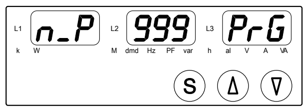
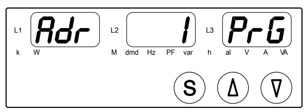
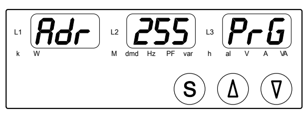
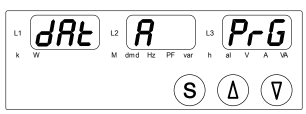
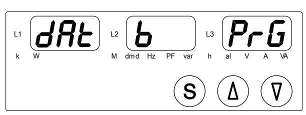
			Default
3.	 Figure 9  Figure 10	"**Ct.r**" (Current transformer ratio). Press '**S**' to enter **editing** mode "**PrG**" and enter value (1– 999) using ▲ and ▼. Confirm by pressing '**S**' **Example:** If the primary of the CT is 300A and the secondary is 5A, the CT ratio is 60 (obtained from the calculation: 300/5). Press ▼ to go to the next setup function. Press ▲ to go to the previous setup function.	1
4.	 Figure 11  Figure 12	"**E.rE**" (Reset of energy and hour meters[1]). If you want to reset the energy and hour meters press '**S**' to enter **editing** mode "**PrG**" and use ▲ and ▼ to select '**YES**'. Confirm by pressing'**S**' Press ▼ to go to the next setup function. Press ▲ to go to the previous setup function.	No
5.	 Figure 13  Figure 14	"**End**" (Exit Setup mode). **IMPORTANT! Press 'S' to confirm new parameters or selections and leave the Setup menu!** To enter **Detailed Setup** use ▲ and ▼ to select '**no**'. Confirm by pressing '**S**'.	Yes

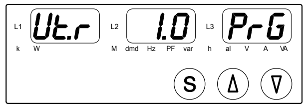
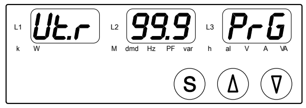
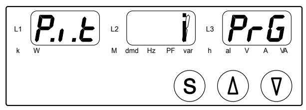
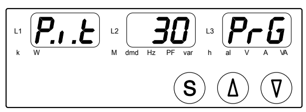
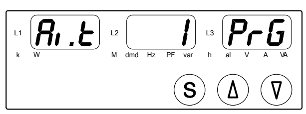
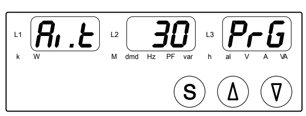
1 The energy meter is read by the MAS base unit while the hour meter is only an internal meter. Making this reset will reset the MAS energy meter but will not affect the MAS run time meter in any way.

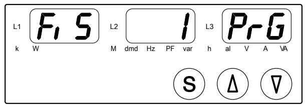
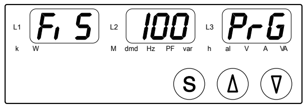
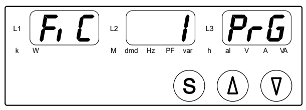
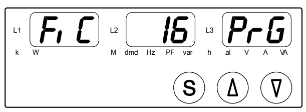
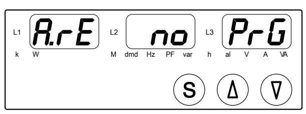
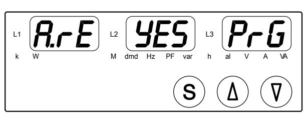
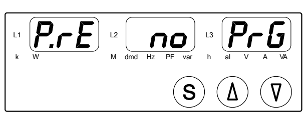
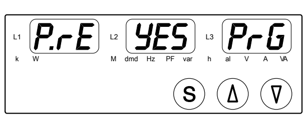
Detailed setup

Detailed setup

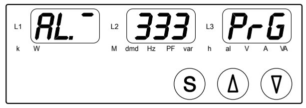
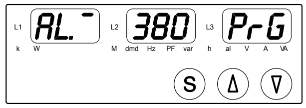
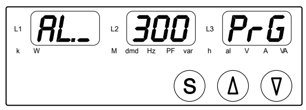
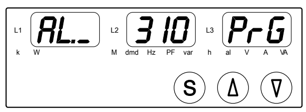
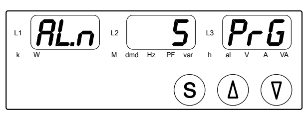
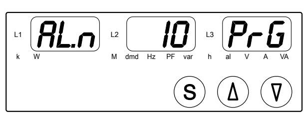
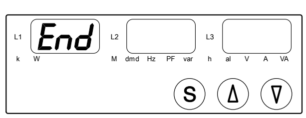
Table 2

			Default
6.	 Figure 15  Figure 16	“**n_P**” (New password) is shown. If you want to change password, press ‘S’ to enter editing mode “**PrG**”, then use ▲ and ▼ to change value. Confirm by pressing ‘**S**’ Press ▼ to go to the next setup function. Press ▲ to go to the previous setup function.	0
7.	 Figure 17  Figure 18	“**Adr**” (Instrument serial port Modbus address). Press ‘**S**’ to enter **editing** mode “**PrG**” and enter value (1 – 255) with ▲ or ▼. Confirm with ‘**S**’ Press ▼ to go to the next setup function. Press ▲ to go to the previous setup function.	255
8.	 Figure 19  Figure 20	“**dAt**” (Modbus data format). If you want to change the Modbus data format (swap the order of the data flow), press ‘S’ to enter editing mode “**PrG**”, and use ▲ and ▼ to select wanted format. Confirm by pressing ‘**S**’ "A": LSB first, MSB last. "B": MSB first, LSB last. Press ▼ to go to the next setup function. Press ▲ to go to the previous setup function.	A

			Default
9.	 Figure 21  Figure 22	"**Ut.r**" (Voltage transformer ratio). Press '**S**' to enter **editing** mode "**PrG**" and enter value (1.0 to 99.9) using ▲ or ▼ and confirm by pressing '**S**' **Example:** If the primary of the VT is 5kV and the secondary is 100V, the VT ratio is 50 (obtained from the calculation: 5000/100). Press ▼ to go to the next setup function. Press ▲ to go to the previous setup function.	1
10.	 Figure 23  Figure 24	"**P.i.t**" (Power integration time), is used to calculate 'Power dmd' (Power mean value). Press '**S**' to enter **editing** mode "**PrG**" and enter time over which the average is formed (1 - 30 minutes) with ▲ or ▼ and confirm by pressing '**S**' Press ▼ to go to the next setup function. Press ▲ to go to the previous setup function.	15
11.	 Figure 25  Figure 26	"**A.i.t**" (Amperage integration time) is used to calculate 'Thermical current'. Press '**S**' to enter **editing** mode "**PrG**" and enter time over which the average is formed (1 - 30 minutes) with ▲ or ▼ and confirm by pressing '**S**' Press ▼ to go to the next setup function. Press ▲ to go to the previous setup function.	15

			Default
12.	 Figure 27  Figure 28	“Fi.s” (Filter range). Press ‘S’ to enter editing mode “**PrG**” and set the operating range of the digital filter with ▲ or ▼ and confirm by pressing ‘**S**’ The value is expressed as % of the full scale value. Press ▼ to go to the next setup function. Press ▲ to go to the previous setup function.	2
13.	 Figure 29  Figure 30	“Fi.c” (Filter coefficient). Press ‘S’ to enter editing mode “**PrG**” and enter the coefficient value (1 - 16) with ▲ or ▼ and confirm by pressing ‘**S**’ A higher value increases the stability and the settling time of the measurements. Press ▼ to go to the next setup function. Press ▲ to go to the previous setup function.	2
14.	 Figure 31  Figure 32	"**A.rE**" (Alarm reset[2]). If you want to reset the alarms press ‘S’ to enter editing mode "PrG" and use ▲ and ▼ to select ‘ES’. Confirm by pressing ‘’. Press ▼ to go to the next setup function. Press ▲ to go to the previous setup function.	No
15.	 Figure 33  Figure 34	“**P.rE**” (Peak reset). If you want to reset the Wdmd and Amax press ‘S’ to enter editing mode "PrG" and use ▲ and ▼ to select ‘ES’. Confirm by pressing ‘’. Press ▼ to go to the next setup function. Press ▲ to go to the previous setup function.	No

2 Only internal alarms in the PAN 312. Resetting alarms and setting alarm limits will not affect the MAS alarms in any way.

			Default
16.	 Figure 35  Figure 36	“AL.¯ ” (Overvoltage: Line-Neutral[2]). Press ‘S’ to enter **editing** mode “**PrG**” and set the trip limit with ▲ or ▼. Confirm with ‘’. Voltage exceeding entered value will trigger an alarm (blinking LED: Al). **Press** ▼ to go to the next setup function. Press ▲ to go to the previous setup function.	0
17.	 Figure 37  Figure 38	“**AL._**” (Undervoltage: Line-Neutral[2]). Press ‘**S**’ to enter **editing** mode “**PrG**” and set the trip limit with ▲ or ▼. Confirm by pressing ‘**S**’. Voltage below entered value will trigger an alarm (blinking LED: Al). Press ▼ to go to the next setup function. Press ▲ to go to the previous setup function. **Note:** If Overvoltage and Undervoltage trip limits are the same, both alarms are disabled.	0
18.	 Figure 39  Figure 40	“**AL.n**” (Overcurrent in the Neutral). Press ‘**S**’ to setup mode “**PrG**” and set the trip limit with ▲ or ▼. Confirm by pressing ‘**S**’ A current through neutral exceeding the trip limit will trigger an alarm (LED: Al). If the ‘L.n’value is 0, the neutral current alarm function will be disabled. The alarm status is displayed by a blinking LED. **Press** ▼ to go to the next setup function. Press ▲ to go to the previous setup function.	0
19.	 Figure 41	“**End**” (Exit **Setup** mode). IMPORTANT! Press ‘S’ to confirm new parameters or selections and leave the Setup menu! Press ▼ to go to the next setup function. Press ▲ to go to the previous setup function.	

Key pad actions - View mode

Key pad actions - View mode

Key pad functions in View mode

(S)	enter **Setup** mode when in **View** mode
(▲)	scroll to the previous displayed system variable
(▼)	scroll to the next displayed system variable

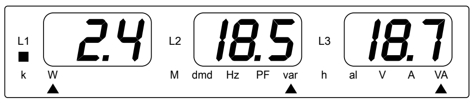


Figure 42: Menu 1

System active power (W), system reactive power (var), and system apparent power (VA).

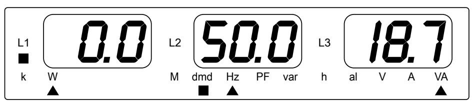


Figure 43: Menu 2

dmd[3]-value of system active power (W), system frequency (Hz), dmd*-value of apparent power (VA).

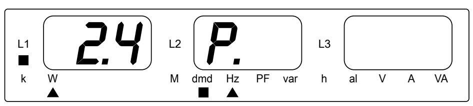


Figure 44: Menu 3

dmd[3]-value of maximum system active power (W).

P = Peak.

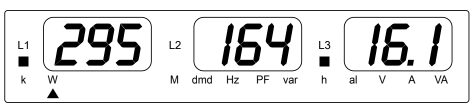


Figure 45: Menu 4

Total active energy consumption kWh. The screen value is 29516416.1 kWh.

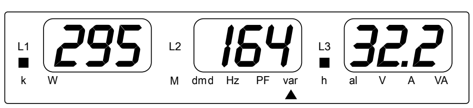


Figure 46: Menu 5

Total reactive energy consumption varh. The screen value here is 29516432.2 kvarh.

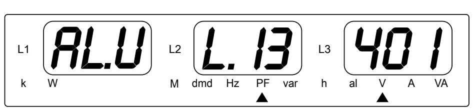


Figure 47: Menu 6

System power factor, Phase to phase voltage. Voltage alarm AL.U is actived only if one of the phase voltages is outside of the set limit.

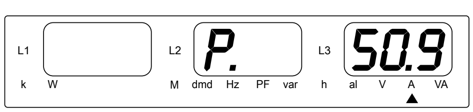


Figure 48: Menu 7

Maximum current among the three phases.

P = Peak.

[3] dmd = demand means average value during selected integration time from 1 to 30 minutes. dmd is used by electricity suppliers as input for billing.

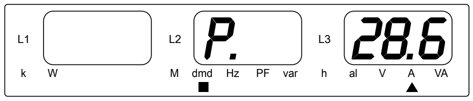


Figure 49: Menu 8

dmd[3]-value of maximum current among the three phases.

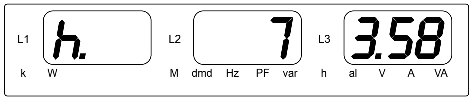


Figure 50: Menu 9

Total operating time. The screen here shows 73.58 hours.



Figure 51: Menu 10

Phase voltage (phase to neutral) for each phase. V L1-N, V L2-N, V L3-N.



Figure 52: Menu 11

Phase to phase voltage. VL12, VL23, VL31.

Decimal points blink.

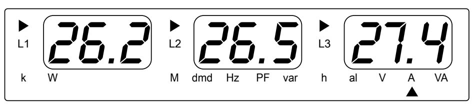


Figure 53: Menu 12

Phase currents.

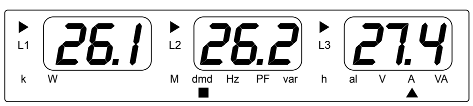


Figure 54: Menu 13

dmd[3]-value of three phase current.

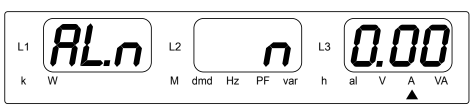


Figure 55: Menu 14

Neutral current.

If neutral current alarm is active, “AL.n” is shown.

If neutral current alarm is not active, “n” is shown.

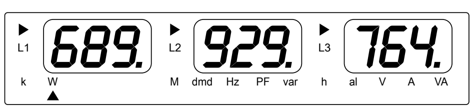


Figure 56: Menu 15

Active power of each phase. WL1, WL2, WL3.

Decimal points blink if power is negative (generated power, or wrong polarity connection of CT).

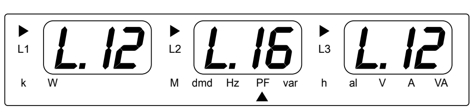


Figure 57: Menu 16

Power factor of each phase, PF L1, PF L2, PF L3. The example shows a power factor of 0.12, 0.16 and 0.12 for an electric motor.

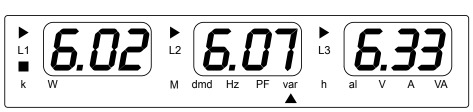


Figure 58: Menu 17

Reactive power of each phase. var1, var2, var3.

Decimal points blink if power is negative (generated power, or wrong polarity connection of CT).

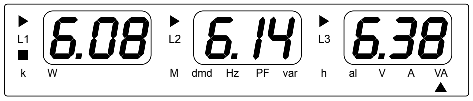


Figure 59: Menu 18

Apparent power (VA) of each phase, VA L1, VA L2, VA L3.

Xylem |'zīləm|

1) The tissue in plants that brings water upward from the roots
2) A leading global water technology company

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The original instruction is in English. All non-English instructions are translations of the original instruction.

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